Material Processing Group

Tailoring joining and cutting technology to complex design concepts

The LLNL Material Processing Group uses a broad range of joining and cutting technologies to develop and fabricate precision components and assemblies. Our special features include

- State-of-the-art lasers for welding, brazing, cladding, cutting, and drilling
- Electron beam equipment for welding in a vacuum environment
- Vacuum ovens for bulk brazing of fine components
- Precision gas tungsten arc welder for semiautomatic welding.

Problem solving experience

The Material Processing Group is able to tailor joining and cutting technology to complex fabrication design concepts. The group has extensive experience joining and cutting unusual and problematic materials ranging from refractory metals to ceramics and composites. Our experience is also reflected in the fabrication of close tolerance, complex components, and assemblies where material thickness and component dimensions are measured in thousands of an inch and tolerances are maintained to a fraction of thousandths of an inch.

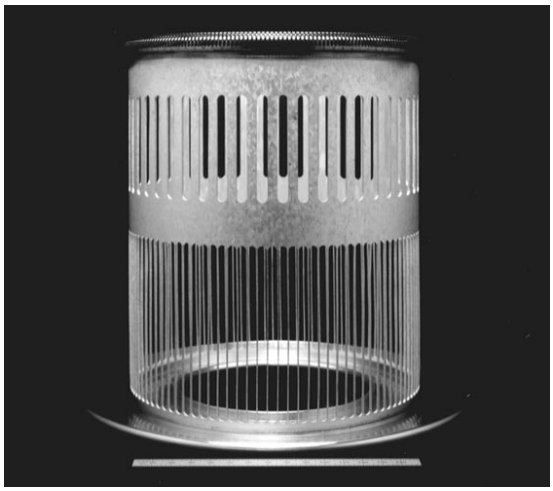
APPLICATIONS

- *Apply joining and cutting technologies to previsional and problematic components*
- *Use state-of-the-art lasers for welding, brazing, cladding, cutting, and drilling*
- *Work with electron beam equipment for welding in a vacuum environment*

Our group is highly versed in material selection for development applications and has the capability to characterize materials and processes with its own metallurgical facility, which is located in the same building. In addition, we are experienced in working with toxic and reactive materials, often designing whole welding and cutting systems to effectively handle the materials.

Laser processing

We rely on a full range of laser processing when fabrications using thin materials require precision cutting, welding, brazing, and small-hole drilling. The lasers that are available include the 5000-W continuous-wave CO_2, 1000-W pulsed-beam CO_2, and several Nd:YAG-pulsed beam lasers with capabilities up to 400 W.



Sample of precision welding and cutting of advanced materials.

Wavelength coupling is the prime requirement for materials that can be worked using laser processing. These materials include quartz, fused silica, plastics, carbon composites, and metals.

Dull service to customers

We believe that our area has more to offer than nominal capabilities. Group personnel commonly interact with customers to evaluate jobs for laser process applicability and to provide fabrication design support. We work closely with other division work centers and are knowledgeable about the applicability of other related processes. Individuals in the group often work one-on-one with program scientists and engineers to resolve fabrication problems and often work from informal sketches or verbal instructions.

Availability: Available now. Members of our Material Processing Group look forward to discussing your particular needs and interests. We welcome meetings with large or small businesses that are interested in investigating partnerships or licensing arrangements.

Contact

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